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## THE MAN OF PILTDOWN

By GEORGE GRANT MACCURDY

THE story of the Piltdown discovery is already more or less familiar to readers of this journal.<sup>1</sup> But the recent gathering and publishing of additional data<sup>2</sup> on the subject should not be allowed to pass unnoticed. This is especially true not only because of the far-reaching significance of the discovery, but also because British scientists have been known to be at odds concerning the reconstruction of the skull in question.

It will be recalled that Dr Smith Woodward regarded the Piltdown specimen as the type of a new genus of the family Hom-inidæ, to which he gave the name *Eoanthropus dawsoni*, and which was defined primarily by the characters of the mandible. Of the mandible only the right ramus with first and second molar teeth *in situ* was at first discovered. The condyle and symphysis were both lacking, but the fragment was of sufficient size to enable Dr Smith Woodward to reconstruct the symphysis with a fair degree of accuracy. It was the reconstruction of the cranium about which differences of opinion arose between Dr Smith Woodward and Professor Elliot Smith on the one hand and Professor Arthur Keith on the other.

Of the brain case nine fragments, parts of the frontal, parietal occipital, and temporal, were found. From these Dr Smith Woodward reconstructed a skull with a capacity of about 1076 cc. On the other hand a reconstruction by Professor Keith gave to the skull a brain capacity of 1500 cc., in other words that of a well-developed modern European skull. After further study Dr Smith

<sup>1</sup> *American Anthropologist*, N. S. xv, Apr.-June 1913.

<sup>2</sup> Chas. Dawson and A. Smith Woodward, Supplementary Note on the Discovery of a Palæolithic Human Skull and Mandible at Piltdown (Sussex), *Quar. Jour. Geol. Soc.*, LXX, Apr. 1914.

Woodward acknowledges a small error. He finds that the "longitudinal ridge along the outer face at the hinder end of the parietal region is not median, but one of a pair such as frequently occurs in the lower types of human crania." In the published reconstruction there should thus be a slight readjustment of the occipital and right parietal bones, "but the result does not alter essentially any of the conclusions already reached."

With this opinion Professor Elliot Smith is in complete accord. From an examination of the original fragments he was able to determine the location of the median line of the skull. The persistence of slight traces of the sagittal suture in the regions of the bregma and lambda made this possible. The true median plane

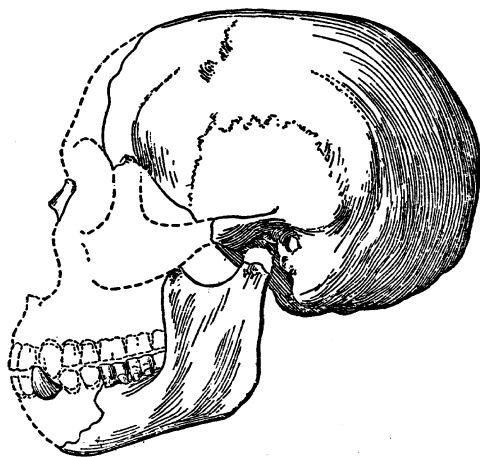
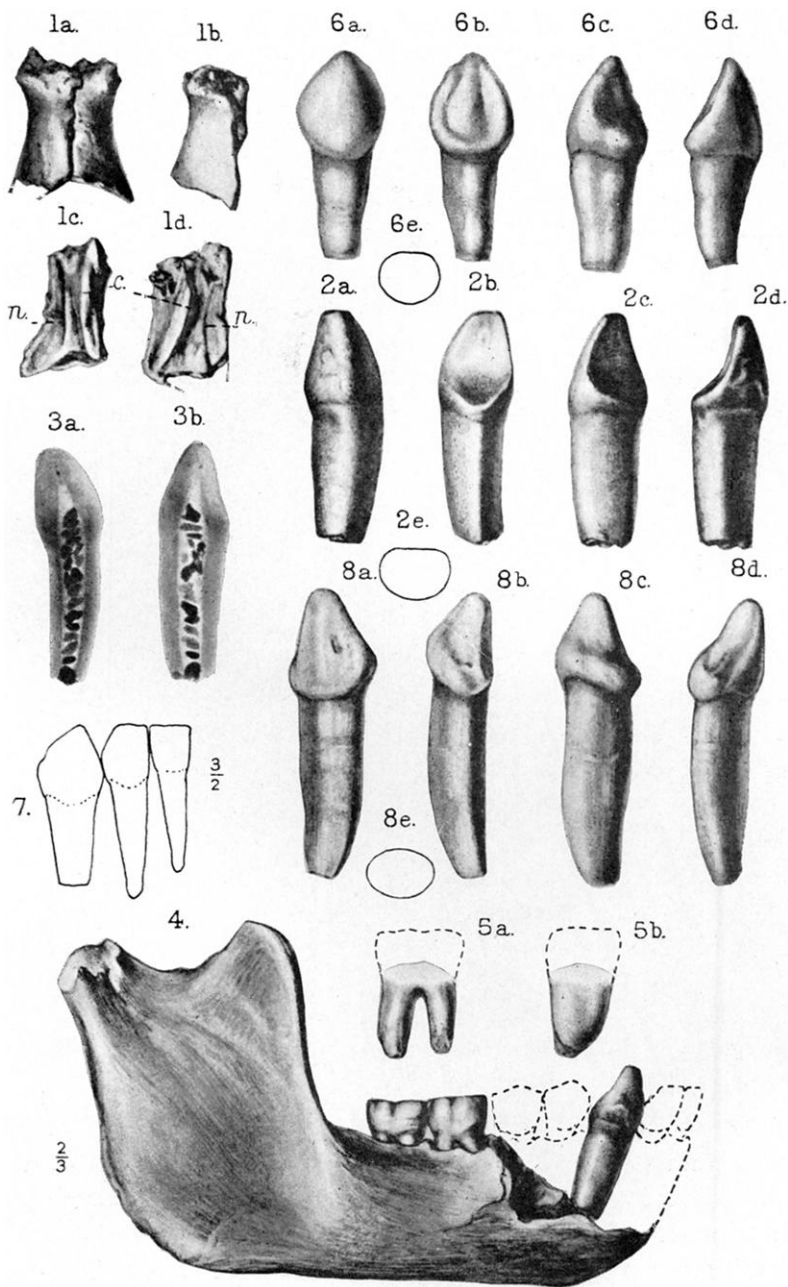


FIG. 110.—Restoration of the skull and lower jaw of *Eoanthropus dawsoni*; nearly a third of natural size. After Dawson and Woodward.

in this particular case however passes a little to the left of the union of the coronal with the sagittal suture owing to a slight deflection of the latter. Since this deflection is never more than a few millimeters (except where large bregmatic wormian bones are present, and they are not present in this case), the bregma and lambda are good guides in locating the median plane. In line with the

median plane as thus determined, the endocranial aspect of the frontal bone presents a well-defined longitudinal ridge, corresponding to the "place where the two halves of the frontal bone originally came together at the metopic suture." The cranial capacity then of the Piltdown skull is evidently not very much greater than the original estimate of 1076 cc.

In addition to exhaustive laboratory studies on the parts above



Figs. 1a-1d. Nasal bones of *Eoanthropus dawsoni*. Figs. 2a-2e. Right lower canine of *E. dawsoni*. Figs. 3a-3b. Radiograph of the same. Fig. 4. Right mandibular ramus of *E. dawsoni*. Figs. 5a-5b. Impression of cavity for roots of third lower molar. Figs. 6a-6e. Right lower milk-canine of *Homo sapiens*. Fig. 7. Right lower milk-canine and milk-incisors of *H. sapiens*. Figs. 8a-8e. Right lower milk-canine of *Simia satyrus*. Natural size unless otherwise indicated. After Dawson and Woodward.

mentioned, a painstaking and systematic search was made at the Piltdown site. The mandibular ramus had been found *in situ*. All the gravel *in situ* within a radius of 5 meters of this spot was "either washed with a sieve, or strewn on specially prepared ground for the rain to wash it; after which the layer thus spread was mapped out in squares, and minutely examined section by section." In this spread Father Teilhard de Chardin, assisting at the work for three days, found the right canine tooth in August, 1913. The two human nasal bones and the turbinated bone were not recovered from this spread but from disturbed gravel within less than a meter of the spot where the mandible had been discovered.

The nasal bones (pl. xxx, 1a-1d) are said to "resemble those of existing Melanesian and African races, rather than those of the Eurasian type." In thickness they correspond to the bones of the skull previously found. The canine tooth not only corresponds in size to the mandible but belongs to the same half (right) as that recovered. It likewise agrees with the two molar teeth in the degree of wear due to mastication. The extreme apex is missing, but whether by wear or by accidental fracture is not determinable. The enamel on the inner face of the crown (pl. xxx, 2b) has been completely removed by wear against a single opposing tooth. The worn surface "extends to the basal edge of the crown, as indicated by the clear ending of the cement along its lower margin." This canine tooth is larger than any human canine hitherto found, and interlocked with the opposing upper canine. It rose above the level of the other teeth and was separated from the lower premolar by a diastema. On the other hand there is no facet due to wear against the outer upper incisor, such as often occurs in the apes.

If a comparative anatomist were fitting out *Eoanthropus* with a set of canines he could not ask for anything more suitable than the tooth in question. It conforms to a law in mammalian paleontology, "that the permanent teeth of an ancestral race agree more closely in pattern with the milk-teeth than with the permanent teeth of its modified descendants." Even a cursory view of plate xxx will bring out the points of resemblance between the Piltdown canine (figs. 2a-2d) on the one hand and the corresponding milk

canines of *Homo sapiens* (figs. 6a-6d) and of *Simia satyrus* (figs. 8a-8d) on the other. It is pointed out that in recent Man if the base of the crown of the canine were raised in the gum to the same level as that of the adjacent teeth, its apex would frequently rise well above the rest of the dental series (pl. xxx, fig. 7).

The various elements that make up the gravel bed at Piltdown (Sussex) are better known today than when the first report was published; additional fossil animal remains have also been recovered. Four

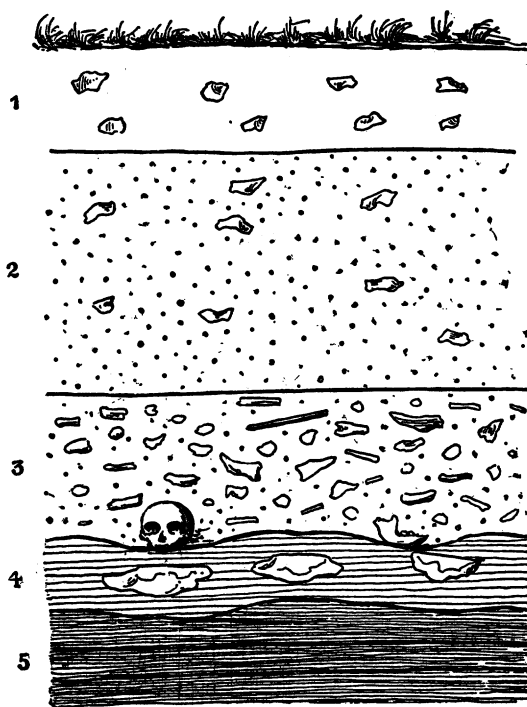


FIG. III.—Section of gravel bed at Piltdown (Sussex). After Dawson and Woodward.

well-defined layers have been determined (fig. III). At the top is a deposit of surface soil 35 cm. thick, containing pottery and flint implements of various ages. The second bed consists of undisturbed gravel varying from a few centimeters to a meter in thickness. The prevailing color is "pale yellow with occasional darker patches."

A rude paleolith of the Chellean type was found in the middle of this layer, which likewise contained rolled iron-stained subangular flints. The third layer, some 50 cm. thick, is easily distinguished because of its dark ferruginous appearance. It contains rolled and subangular flints similar to those found in the layer above. All the fossils (with the exception of the remains of the deer) were either discovered in or have been traced to this third layer. So-called eoliths and at least one worked flint were likewise found here. The *Eoanthropus* remains came from it and near the uneven floor forming the upper limit of the fourth stratum. The latter has a thickness of about 25 cm., is non-fossiliferous, and "contains flints of a much larger size than any of those in the overlying strata." Nothing that could be called an implement or eolith has been reported from the fourth bed. Below (no. 5) are undisturbed strata of the Tunbridge Wells Sand (Cretaceous).

Our knowledge of the Piltdown fossil fauna has been supplemented by the finding of remains of one new form, a fragment of a tooth of *Rhinoceros*, in the same state of mineralization as the teeth of *Stegodon* and *Mastodon* previously described. While the specimen cannot be determined with absolute certainty, it belongs either to *Rhinoceros mercki* or *Rh. etruscus*, with the evidence rather favoring the latter. Additional remains of *Stegodon* (fragments of a molar) and *Castor* (fragment of mandible) were likewise recovered. Judged from its fossil content the third stratum at Piltdown would be classed as Pliocene were it not for the presence of *Eoanthropus* and the beaver. In view of the fact that the remains of these, although softer, are not so rolled and worn as the other fossil remains; the third bed, although composed in the main of Pliocene drift, was probably reconstructed in early Pleistocene time.

Those who might have objected to the use of the name *Eoanthropus* for the Piltdown skull can no longer deny its appropriateness when applied to the lower jaw, especially since the finding of the canine tooth. While the probabilities are all in favor of the three parts belonging to one and the same individual, the case for *Eoanthropus* does not have to depend on producing positive proof

to that effect. The only flint implement of Chellean type came from the layer above (no. 2), and is of later date than the human remains. Did *Eoanthropus* make use of the eoliths found in tell-tale association with him? The Future holds this secret, and, if hard enough pressed, may some day reveal it.

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